

CLAIMS

What is claimed is:

5 1. A device for measuring fetal blood pH, comprising:
means for mounting the device to an operator's hand;
a lancet extendable from a distal end of the device for incising tissue; and
a capillary extendable from the distal end of the device for collecting a sample of
blood for pH analysis.

10 2. The device for measuring fetal blood pH of claim 1, wherein the means for
mounting the device to an operator's hand is in the form of a surgical glove to which the
device is mounted.

15 3. The device for measuring fetal blood pH of claim 1, wherein the means for
mounting the device to an operator's hand is in the form of a finger cot to which the
device is mounted.

20 4. The device for measuring fetal blood pH of claim 1, wherein the means for
mounting the device to an operator's hand is in the form of a finger ring to which the
device is mounted.

5. The device for measuring fetal blood pH of claim 1, wherein the lancet is slidably mounted in a lancet guide tube.

6. The device for measuring fetal blood pH of claim 5, wherein the lancet is
5 connected by a lancet actuator rod to a lancet actuator located at a proximal end of the lancet guide tube.

7. The device for measuring fetal blood pH of claim 1, wherein the capillary is slidably mounted in a capillary guide tube.

8. The device for measuring fetal blood pH of claim 7, wherein the capillary is
10 connected by a capillary actuator rod to a capillary actuator located at a proximal end of the capillary guide tube.

9. The device for measuring fetal blood pH of claim 7, wherein the capillary is
15 configured to be withdrawn from a proximal end of the capillary guide tube.

10. The device for measuring fetal blood pH of claim 1, wherein the capillary has
a distal end configured as a capillary bulb.

11. The device for measuring fetal blood pH of claim 10, further comprising a pH
20 electrode positioned within the capillary bulb.

12. The device for measuring fetal blood pH of claim 1, further comprising means for isolating a distal region of the pH measuring device from a surrounding region.

13. The device for measuring fetal blood pH of claim 12, wherein the means for isolating a distal region of the pH measuring device from a surrounding region is in the form of an everting bell-shaped member.

14. The device for measuring fetal blood pH of claim 12, wherein the means for isolating a distal region of the pH measuring device from a surrounding region is in the form of an inflatable balloon member.

15. The device for measuring fetal blood pH of claim 12, wherein the means for isolating a distal region of the pH measuring device from a surrounding region is in the form of an expandable funnel member.

16. The device for measuring fetal blood pH of claim 1, further comprising a motorized actuator for sequentially advancing the lancet and the capillary.

17. The device for measuring fetal blood pH of claim 1, further comprising a light source for illuminating a region distal to the device.

18. A device for measuring fetal blood pH, comprising:
a lancet guide tube;

a lancet slidably mounted in the lancet guide tube and connected by a lancet actuator rod to a lancet actuator located at a proximal end of the lancet guide tube, wherein the lancet is selectively extendable from a distal end of the lancet guide tube for incising tissue;

5 capillary guide tube;

a capillary slidably mounted in the capillary guide tube and connected by a capillary actuator rod to a capillary actuator located at a proximal end of the capillary guide tube, wherein the capillary is selectively extendable from a distal end of the capillary guide tube for collecting a sample of blood for pH analysis; and

10 means for mounting the lancet guide tube and the capillary guide tube to an operator's hand.

19. The device for measuring fetal blood pH of claim 18, further comprising means for isolating a distal region of the pH measuring device from a surrounding region.

15 20. The device for measuring fetal blood pH of claim 18, further comprising a motorized actuator for sequentially advancing the lancet and the capillary.

21. A method for measuring fetal blood pH, comprising:

20 inserting a hand-mounted pH device in proximity of a presenting part of a fetus in parturition;

isolating a region adjacent to a distal end of the pH device from a surrounding region;

advancing a lancet from the distal end of the pH device and incising tissue in the presenting part of the fetus; and

advancing a capillary from the distal end of the pH device and collecting a sample of blood from the incised tissue for pH analysis.

5